AUSTRALIAN MOSSES.

Some Locality Pictures.

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The Editor has suggested to me that brief "pen pictures" of Australian Moss localities might interest readers of the BRYOLOGIST; and with that object in view, and with the added purpose of assisting the cause of Australian bryology, I shall be glad to send an occasional paper to a publication that has interest, not only in America and Europe, but even in these far-off Southern lands.

I begin with the district in which I am at present located, the district of Young, in New South Wales,—not my first, but my latest, bryological love.

The town of Young lies a few miles northwest of the main Southern line from Sydney to Melbourne. "As the crow flies" it is about 150 miles from the coast, 200 miles from Sidney, and stands 1400-1500 feet above sea-level. It was formerly an important gold field, and the vincinity of old watercourses has been honey-combed by the alluvial miner. The district is diversified with hill and hollow. Our chief products are wool and wheat,—and rabbits. The climate is healthy. Such rains as we get fall mainly in the Winter; the Summer is usually hot and dry. The temperature ranges from a few degrees of frost in Winter, bringing us very rarely a touch of snow, up to as much as 115-120 degrees in the middle of Summer. Our mosses are mostly denizens of rock and ground, and must be looked for during the Winter and the early Spring, say July to October.

Outcrops of granite occur in all parts of the district. In some directions they develop into high rocky hills: humbler outcrops, with the grass growing to their base, are a distinguishing feature on every hand. Where the land has not been cleared, the characteristic "gum" tree lends picturesqueness to the view.

I propose a visit to one of these granite outcrops, choosing a spot where the rocks, worn with the weather of unknown centuries, are flanked by open country that stretches down to rich alluvial flats. It is the month of August, when the moss-fruits are rapidly hastening to maturity, some of them already displaying their open capsules, while others still retain the veil.

Examining first the rocks themselves, we find that the most obtrusive species are Taylor's *Grimmia cygnicollis*, and *G. leiocarpa*. The first of these, Mitten identified with G. pulvinata, var. obtusa (Brid.), and Brotherus, in Bryales, follows him. Wilson regarded G. leiocarpa, Tayl., as a var. of G. leucophaea, Grev. Brotherus agrees, but merges G. leucophaea in G. campestris, Burch. I cannot yet throw off the familiar names. We shall also find, perhaps in large quantities, *Hedwigia albicans* (Web.) Lindb. (H. ciliata, Ehrh.). C. Mueller regarded the Australian moss as a new species, H. microcyathea, C. M. *Hedwigidium imberbe*, Sm., is also here, but without any trace of fruit: *Pseudoleskea calochlora*, C. M.. and *Tortula princeps*, DeNot. If we follow Brotherus in his conclusions regarding the two Grimmias, we shall be struck with the remarkably northern character of this rock

flora. T. princeps, though sometimes growing on the bare rock, prefers hollows or crevices where a little soil has collected.

Still keeping to the rocks, we may find in obscure corners, sheltered and half-hidden by some overhanging projection, the unique and beautiful *Fabronia Tayloriana*, Hamp., perhaps in the form *foliis integris*, Broth. *Fabronia Scottiae*, C. M., may also be found, a species wide-spread in N. S. W., and which was first collected by Miss Scott, now Mrs. Forde, a lady who in her earlier years spent much time and showed much skill in making drawings of many of our Australian mosses. In the crevices of the rocks we shall find a few species of *Bryum*, but, in the absence of fruit, for they are mostly sterile, some of them are not yet determinable. We may note, however, *B. subatropurpureum*, C. M., *B. peraristatum*, C. M., (a beautiful species), *B. erythropyxis*, C. M., and perhaps *B. pachytheca*, C. M., which last is exceedingly plentiful throughout the district, growing mostly upon the ground, where, mixed with Funaria hygrometrica, it forms a perfect picture, with its thick, dark-red, hanging capsules, a typical Doliolidium.

Turning now to the ground at the base of the rocks, generally damp and shaded, we shall find probably specimens of *Breutelia affinis* (Hook.) Mitt.; *B. commutata* (Hamp.) Par.: *Bartramia papillata*, H. f. W.; *B. gymnostoma*, Broth,, sp. nov., in appearance very much like B. papillata, but distinguished, as the name implies, by its want of a peristome: *Bryum calodictyon*, Broth., sp. nov., a most distinctive and dainty species of the Argyrobryum group: *Triquetrella papillata* (H. f. W.): perhaps also *Tr. albicuspes*. Broth., sp. nov,: *Weisia flavipes*, H. f. W.: *Hymenostomum Sullivani*, C. M. (rarely): *Encalypta tasmanica*, Hamp. et C. M.: *Funaria hygrometrica* (L)Sibbth., var. *sphaerocarpa* (M: as sp.): *F. tasmanica*, Hamp., a fine species with very distinctive characters: *F. (Entosthodon) apophysata* (Tayl.): *F. (Entosth.) aristata*, Broth., very similar to the preceding, but differing in its percurrent nerve: *Fissidens elamellosus*, Hamp. et C. M.: *F. macrodus*, Hamp.: the inevitable *Ceratodon purpureus*; possibly *Campylopus Woollsii*, C. M., *Ditrichum affine*, C.M., and two or three species of Pottiaceae which anticipate those growing on the open ground that slopes down to the richer flat country.

Leaving then the rocks, we turn our attention to the hard ground, where the grass grows scantily and bare spaces of water-washed soil provide treasure spots for the bryologist. If one has been previously accustomed to the luxuriating coastal mosses, especially the fine, tree-loving, sub-tropical forms of the Northern Rivers, he will simply revel in the rarities here displayed. Dignity he will throw to the winds; he will not even go down upon his hands and knees; he will lie flat upon the ground, and, lens in hand, forget the world and its cares in the delighted contemplation of the rich garden of Nature spread out before him. The Pottiaceae are particularly in evidence, as they are throughout the district. Probably *Tortula atrovirens* (Sm.), will be the first thing to greet our eye; then *Barbula calycina* Schwgr., and perhaps *B. torquata*, Tayl. Before turning to the minuter mosses that constitute the special attraction of the spot, we take note of *Bryum pachytheca*

and the *Entosthodons* already mentioned. Then the tiny capsules of *Pottia brachyodus*, Hamp., or *P. brevicaulis* (Tayl.), or even both of them. We shall not have far to look for *Acaulon Sullivani*, C. M.: while, growing with it or in separate clusters, we may see *Acaulon robustum*, Broth., sp. nov., easily distinguished by its larger and stronger form. *Astomum cylindricum*, Tayl., and *Pleuridium nervosum* (Hook.), are almost sure to be there, and, more rarely, *Pleuridium gracilentum*, Mitt. and *Eccremidium pulchellum*, H. f. W. But, most attractive of all, we shall see the lovely *Gigaspermum repens* (Hook), with its large white transparent perichaetial leaves, and *Goniomitrium enerve*, Hook. et Wils.. with its distinctive calyptra; possibly *G.acuminatum*, Hook. et Wils., may also be there, as it occurs (rarely) in the district. Then, if we are fortunate in our choice of a spot, we may see a rarity indeed: *Trachycarpidium Novae Valesiae*, Broth., sp. nov. At first glance we may mistake it for a Goniomitrium: but we shall readily notice the absence of the angles in the veil, and the long Archidium-like leaves that surround the fruit. This species is the second of the new genus that Brotherus, in Bryales, founded upon a New Caledonian moss. It has proved to be widespread in the district. I collected it only last week in the Cowra district, nearly fifty miles from here. You may be fortunate enough to find in this spot, though they are rare and have only been found by me occasionally, *Barbula acrophylla*, C. M., *B. australasiae* (Hook. et Grev.), *B. chlorotricha* (Broth. et Geh. Par., *B. austro-unguiculata*, C. M., and *Tortula evanescens*, Broth., sp. nov.

Coming down to the flat country, if we take a fallow paddock, we shall find over again many of the ground mosses already discovered, but probably in finer condition than on the hill slopes, especially the Acaulons and the Pleuridiums. *Pl. gracilentum* seems to prefer the lower, damper habitat. We may find too, probably by accident if we are not looking specially for it, the minutest of all the species of this district; *Ephemerum cristatum* (H. f. W.) a truly beautiful moss, of which I have collected good material in fruit. *Bryum argenteum*, var. *niveum*, will be found plentifully, and possibly the rare *Funaria pilifera*, Broth.

Cutting its way through this flat country we may find a creek so-called; and among the grass of its banks we may find, in addition to many of the foregoing, *Hypnum patulum*, Hamp., and *H. tenuifolium*, H. f. W., often in association with *Breutelia commutata*. Close by we may find some old, partially filled mining shafts, and on their damp shady banks we shall discover such species as *Bryum calodictyon*, Broth, the Firidentes, Fungriae, Bartramiae, etc. already mentioned, as well as *Brachythecium rutabulum*, *Stereodon cupressiformis* and a Philonotis not yet determined.

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(To be Continued)